Notice of Allowability	Application No.	Applicant(s)	
	09/810,167	KIERNAN ET AL.	
	Examiner	Art Unit	
	HUNG Q PHAM	2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Appeal Brief 08/13/2004*.

2. ☒ The allowed claim(s) is/are *1-43,45 and 46*.

3. ☒ The drawings filed on *18 June 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *022705* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

SHAHID ALAM
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with applicants' representative, Ram Soundararajan, on 02/17/2005.

Replace claim 1 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 1) ***A computer implemented method of tagging results of an XML query over a relational database, said method comprising:***

generating a tagger tree graph from said XML query, each node of said tagger tree graph comprising a tagger operator, each tagger operator having a tagger parse tree associated therewith;

calling each tagger operator in accordance with a structure of said tagger tree graph, and evaluating said tagger parse trees associated with each called tagger operator to tag results of said XML query over said relational database.

Replace claim 2 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 2) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, wherein said tagger node graph has a top-most tagger operator and a plurality of lower-most tagger operators, said calling and evaluating steps further comprising:***

a. starting with said top-most tagger operator, each tagger operator implementing a method to request results from inputs to said tagger operator, said method causing lower level tagger operators connected to said inputs to be called;

b. starting with said lower-most tagger operators, each called tagger operator returning intermediate tagged results to a higher-level connected tagger operator upon evaluating said associated parse tree;

performing steps a and b until an end of said results of said XML query is reached, and said top-most tagger operator producing tagged output XML of said results of said XML query.

Replace claim 3 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 3) *A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, wherein said tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator.*

Replace claim 4 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 4) *A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, wherein said tagger tree graph includes a tagger operator for each level in a result XML tree of said XML query.*

Replace claim 5 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 5) *A computer implemented method of tagging results of an XML query over a relational database, as per claim 4, wherein said tagger input operators execute in a sorted outer union mode.*

Replace claim 6 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 6) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 5, wherein said tagger input operators comprise a shared tagger row stream.***

Replace claim 7 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 7) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 4, wherein said tagger input operators execute in a node strip mode.***

Replace claim 8 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 8) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 7, wherein each of said tagger operators comprises a tagger row stream.***

Replace claim 9 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 9) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, wherein each tagger operator performs any of a cr8_ elem, a cr8_attr, a cr8_ attr_ list, a cr8_fragments or a cr8_fragment_ list function.***

Replace claim 10 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 10) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, wherein each tagger operator implements a next method to produce a result row.***

Replace claim 11 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 11) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, said method further comprising:***

parsing said XML query;

transforming said parsed XML query into a language-neutral intermediate representation;

rewriting said language-neutral intermediate representation into an equivalent form easily translated into an SQL query;

translating said equivalent form into one or more SQL queries over said relational database, and

executing said one or more SQL queries to produce said results of said XML query over said relational database.

Replace claim 12 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 12) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 11, wherein said tagger tree graph is generated from said equivalent form.***

Replace claim 13 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 13) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 11, wherein said tagger tree graph includes a tagger operator for each node in a result XML tree of said XML query.***

Replace claim 14 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 14) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 13, wherein said tagger input operators execute in a sorted outer union mode and said translating step produces a single SQL query to produce a single sorted outer union relational database result.***

Replace claim 15 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 15) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 14, wherein said tagger input operators comprise a shared tagger row stream.***

Replace claim 16 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 16) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 13, wherein said tagger input operators execute in a node strip mode and said translating step produces a set of SQL queries to produce a set of node strip relational database results.***

Replace claim 17 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 17) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 16, wherein each of said tagger operators comprises a tagger row stream.***

Replace claim 18 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 18) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 11, wherein said tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator.***

Replace claim 19 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 19) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 11, wherein a number of relational database tables of said relational database are mapped to a number of virtual XML documents and said XML queries are issued over said virtual XML documents.***

Replace claim 20 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 20) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 1, wherein said method operates over a distributed computing network.***

Replace claim 21 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 21) ***A computer implemented method of tagging results of an XML query over a relational database, as per claim 20, wherein said method operates over the Internet.***

Replace claim 22 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 22) ***A computer-based system for tagging results of an XML query over a relational database, said system comprising:***

a tagger runtime component;

means for generating a tagger tree graph from said XML query, each node of said tagger tree graph comprising a tagger operator;

means for generating a tagger parse tree associated with each tagger operator, and wherein

said tagger runtime component calls each tagger operator in accordance with a structure of said tagger tree graph and evaluates said tagger parse trees associated with each called tagger operator to tag results of said XML query over said relational database.

Replace claim 23 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 23) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, wherein said tagger node graph has a top-most tagger operator and a plurality of lower-most tagger operators, and to perform said calling and evaluating, said tagger runtime component further:***

a. starting with said top-most tagger operator, causing each tagger operator to implement a method to request results from inputs to said tagger operator, said method causing lower-level tagger operators connected to said inputs to be called;

b. starting with said lower-most tagger operators, causing each called tagger operator to return intermediate tagged results to a higher-level connected tagger operator upon evaluating said associated parse tree;

performing steps a and b until an end of said results of said XML query is reached, and upon reaching an end of said results of said XML query, causing said top-most tagger operator to produce a tagged output XML document of said results of said XML query.

Replace claim 24 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 24) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, wherein said tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator.***

Replace claim 25 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 25) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, wherein said tagger graph includes a tagger input operator for each node in a result XML tree of said XML query.***

Replace claim 26 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 26) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 25, wherein said tagger input operators execute in a sorted outer union mode.***

Replace claim 27 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 27) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 26, wherein said tagger input operators comprise a shared tagger row stream.***

Replace claim 28 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 28) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 25, wherein said tagger input operators execute in a node strip mode.***

Replace claim 29 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 29) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 28, wherein each of said tagger operators comprises a tagger row stream.***

Replace claim 30 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 30) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, wherein each tagger operator performs any of a cr8_ elem, a cr8_ attr, a cr8_attr_ list, a cr8 _fragments or a cr8 _fragment _list function.***

Replace claim 31 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 31) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, wherein each tagger operator implements a next method to produce a result row.***

Replace claim 32 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 32) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, said system further comprising:***

a parser, said parser parsing said XML query and transforming said parsed XML query into a language-neutral intermediate representation;

a rewrite engine, said rewrite engine rewriting said language-neutral intermediate representation into an equivalent form easily translated into an SQL query;

a translator, said translator translating said equivalent form into one or more SQL queries over said relational database, and

an RDBMS, said RDBMS executing said one or more SQL queries to produce said results of said XML query over said relational database.

Replace claim 33 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 33) ***A compuer-based system for tagging results of an XML query over a relational database, as per claim 32, wherein said tagger graph is generated from said equivalent form.***

Replace claim 34 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 34) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 32, wherein said tagger graph includes a tagger input operator for each node in a result XML tree of said XML query.***

Replace claim 35 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 35) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 34, wherein said tagger input operators execute in a sorted outer union mode and said translator produces a single SQL query to produce a single sorted outer union relational database result.***

Replace claim 36 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 36) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 35, wherein said tagger input operators comprise a shared tagger row stream.***

Replace claim 37 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 37) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 34, wherein said tagger input operators execute in a node strip mode and said translator produces a set of SQL queries to produce a set of node strip relational database results.***

Replace claim 38 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 38) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 37, wherein each of said tagger operators comprises a tagger row stream.***

Replace claim 39 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 39) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 32, wherein said tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator.***

Replace claim 40 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 40) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 32, said system further comprising:***

a schema mapper, said schema mapper mapping a number of relational database tables of said relational database to a number of virtual XML documents, and

an XML-QL engine, said XML-QL engine issuing said XML queries over said virtual XML documents.

Replace claim 41 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 41) ***A computer- based system for tagging results of an XML query over a relational database, as per claim 22, wherein said system operates over a distributed computing network.***

Replace claim 42 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 42) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 41, wherein said system operates over the Internet.***

Replace claim 43 in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 43) ***A computer-based system for tagging results of an XML query over a relational database, as per claim 22, wherein said tagger runtime operates outside an RDBMS.***

Cancel claim 44 in the Appeal Brief filed on 08/13/2004:

(Claim 44) Cancel

Replace claim 45 (renumbered as 44) in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 45) ***A computer program product comprising a machine-readable medium including computer readable program code therein for tagging results of an XML query over a relational database comprising:***

computer readable program code generating a tagger tree graph from said XML query, each node of said tagger tree graph comprising a tagger operator, each tagger operator having a tagger parse tree associated therewith;

computer readable program code calling each tagger operator in accordance with a structure of said tagger tree graph, and

computer readable program code evaluating said tagger parse trees associated with each called tagger operator to tag results of said XML query over said relational database.

Replace claim 46 (renumbered as 45) in the Appeal Brief filed on 08/13/2004 by the clean version (without underlined and crossed mark) amended by examiner as below:

(Claim 46) ***A computer program product comprising a machine-readable medium including computer readable program code therein for tagging results of an XML query over a relational database as per claim 45, wherein said generated tagger node graph has a topmost tagger***

operator and a plurality of lower-most tagger operators, said calling and evaluating computer readable program code further comprising:

computer readable program code for performing:

a. starting with said top-most tagger operator, each tagger operator requesting results from inputs to said tagger operator, said request causing lower-level tagger operators connected to said inputs to be called;

b. starting with said lower-most tagger operators, each called tagger operator returning intermediate tagged results to a higher-level connected tagger operator upon evaluating said associated parse tree;

performing steps a and b until an end of said results of said XML query is reached, and said top-most tagger operator producing tagged output XML of said results of said XML query.

REASONS FOR ALLOWANCE

Claims 1-43, 45 and 46 (renumbered as 1-45) are allowed.

The following is an examiner's statement of reasons for allowance:

The closet available prior arts, USP 6,604,100, issued to Fernandez et al. also teaches a system, method and program for tagging results of XML query over a relational database. However, Fernandez fails to teach or suggest *a tagger operator, each tagger operator having a tagger parse tree associated therewith; calling each tagger operator in accordance with a structure of said tagger tree graph, and evaluating said tagger parse trees associated with each called tagger operator to tag results of said XML query over said relational database* as in claims 1 and 45, *means for generating a tagger parse tree associated with each tagger operator, and wherein said tagger runtime component calls each tagger operator in accordance with a structure of said tagger tree graph and evaluates said tagger parse trees associated with each called tagger operator to tag results of said XML query over said relational database* as in claim 22. Therefore, the

invention is allowable over the prior arts including the providing steps as indicated above.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q PHAM whose telephone number is 571-272-4040. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Hung Pham
February 22, 2005

SHAHID ALAM
PRIMARY EXAMINER